

P R O J E C T facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

CLEAN coal
TECHNOLOGY

THE PASSAMAQUODDY RECOVERY SCRUBBER™— A CLEAN COAL TECHNOLOGY SUCCESS STORY

PRIMARY PROJECT PARTNER

Passamaquoddy
Technology
Limited Partnership
Thomaston, ME

MAIN SITE

Thomaston, ME

TOTAL ESTIMATED COST

\$18,000,000

COST SHARING

DOE	\$5,982,592
Non-DOE	\$12,017,408

Project Description

With help from the Clean Coal Technology Program, a cement plant in Thomaston, Maine, has solved its pollution problems and maintained employment of the 100 workers at the plant. A clean coal technology called the Recovery Scrubber, invented under the sponsorship of the Passamaquoddy Native American Tribe when it owned the plant, has been the key to success.

The Recovery Scrubber was developed as a way to deal with mounting piles of waste kiln dust at the cement plant. Landfill space is increasingly scarce and expensive. The Tribe's solution was unique: a new technology that would use the kiln dust to "scrub" sulfur dioxide (SO₂) pollutants from the kiln's coal combustion gases. Because the treated kiln dust is used in the process, no wastes are produced, only water and a fertilizer that can be sold to offset costs.

Not only did the technology eliminate the waste dust, it proved to be highly effective in cleaning SO₂ from the kiln's coal combustion gases and in keeping particulate emissions low. As an added benefit, because treated dust is reused in the cement kiln, the need for fresh limestone is reduced.

With the savings on landfill costs and the recycling of wastes, and the income from the sale of by-products, the Recovery Scrubber can pay for itself.

Since the Federal government's Clean Coal Technology project was completed in early 1994, the Recovery Scrubber has become a permanent part of the cement plant, now owned by the Dragon Products Company. The Recovery Scrubber technology is now owned and marketed by Passamaquoddy Technology Limited Partnership.



Program Goal

Coal represents 94% of proven U.S. fossil fuel reserves—a resource far greater than the world's supply of oil. The goal of the U.S. Department of Energy's Clean Coal Technology Program is to facilitate commercialization of advanced coal-based technologies and develop opportunities for economic growth and export. The program also seeks to demonstrate how the efficiency and environmental performance of coal-fired power-generating systems can be increased to make them highly profitable and able to comply with the most stringent environmental regulations.

The objective of this project—which has been achieved—was to demonstrate a full-scale industrial scrubber and waste recovery system retrofitted to a high-sulfur, coal-fired, wet-process cement kiln. This process uses waste dust as the scrubbing reagent to reduce SO₂ emissions by 90% to 95% and produce a marketable, potassium-based fertilizer by-product.

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A CLEAN COAL TECHNOLOGY SUCCESS STORY

CONTACT POINTS

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Project Partners

HPD, Inc.
Naperville, IL
(equipment designing)

CIANBRO CORPORATION
Pittsfield, ME
(construction)

DRAGON PRODUCTS COMPANY
Thomaston, ME
(host site)

Project Benefits

The Recovery Scrubber technology invented under the sponsorship of the Passamaquoddy Tribe shows how advanced technology can be used to resolve environmental problems without high costs.

The technology offers operators of cement plants throughout the world a way to eliminate two pollution problems at the same time: air pollution from the kiln and large quantities of solid waste.

Instead of draining revenue from cement production, the process actually generates revenue from waste-disposal tipping fees and the sale of by-products.

Benefits of the Recovery Scrubber include:

- Sulfur dioxide emissions reductions in excess of 90%, allowing the continued use of high-sulfur coals in cement production.
- Elimination of waste disposal and treatment problems, because the treated kiln dust is used as feed in the kiln.
- Reduced need for limestone feedstock.
- Production of only marketable by-products, which can be sold to offset costs.

Based on the highly successful demonstration at the Dragon Products cement plant in Thomaston, Maine, the scrubber has a potential market of more than 200 cement kilns in the United States and Canada alone.

The Recovery Scrubber has other potential applications as well. It can consume ash from biomass combustion. In addition to industrial applications, the process can be used for cleaning the gases of utility boilers, a feature that has interested several power generators in Eastern Europe. The Thomaston plant is now taking in flyash, lime, sludge from paper mills, landfill leachate, and soil contaminated by oil.

Cost Profile (Dollars in Thousands)

	Prior Investment	FY95	FY96	FY97	Future Funds
Department of Energy *	\$6	—	—	—	—
Private Sector Partners	\$12	—	—	—	—

* Appropriated Funding

Key Milestones

FY92	FY93	FY94
Operations		Reporting